

## INLAND NAVIGATION.

The *extreme and average stages of water* in the rivers during the current month are given in Table VII for regular river stations of the Weather Bureau, from which it appears that none of the large rivers there recorded actually attained to the danger line during the month, but several rose nearly to that point. The principal high waters were: New Orleans on the 8th; Evansville, 20th; Pittsburg, 11th; Lynchburg, Charleston, and Circleville, 9th.

In the Delaware, Susquehanna, and Lehigh rivers ice broke up on the 9th and 10th, and the rivers were so swollen by heavy rains that Lambertville, Trenton, Flemington, Belvidere, Stroudsburg, Water Gap, Lehigh, Easton, Bordentown, Portland, all on the Delaware, and Binghamton, Susquehanna, Oakland, Sunbury, Williamsport, Wilkesbarre, all on the Susquehanna, suffered severely. The flood was the highest since 1841 at some places, but in general since 1862 in the Delaware, and since 1865 in the Susquehanna. The Hudson from Troy to Kingston was highest on the 9th and 10th. At Troy on the 10th the Hudson was 18 inches below the high-water mark of 1884; 24 below that of 1876 and 5 feet below that of February, 1857. Lake Skaneateles was one inch above the old high-water mark on the 5th.

The Merrimac River at Lowell on the 16th, 9 a. m., was 11 feet 2 inches above the dam and beyond the reach of the self-registering river gauge; at Haverhill the highest since 1869;

Concord, N. H., beyond all previous record; Plymouth, N. H., within 8 inches of the flood of 1869.

The Connecticut River was highest at Holyoke on the 16th and 17th; at Turners Falls, on the 16th, 5 inches above all previous maxima; at Hartford, 25 feet 8 inches on the gauge, within 1 foot of 1869; at Hanover, N. H., 22 feet above low water.

*Maine.*—The Androscoggin at Livermore Falls was, on the 16th, higher than for fifty years past, exceeding "the great pumpkin flood" of 1867. The Little Androscoggin at Paris and the Presumpscot at Westbrook were highest on the 15th, exceeding the flood of 1878; at Norway the water was higher than since 1869. The Kennebec at Gardiner and the Biddeford at North Saco and as far up as Berlin, N. H., were higher than in 1843, but the absence of ice diminished the damage, although that was still quite severe. Many dams and bridges were destroyed on the 15th and 16th.

*Virginia.*—The James was highest at Lynchburg on the 10th, but still 2 or 3 feet below danger line. The Reed River was highest at Wytheville on the 8th, but still 2 or 3 feet below the high water of 1878. From this point down the New River and the Kanawha to the Ohio high water prevailed.

*North Carolina.*—The Catawba, Tar, Yadkin, and Neuse rivers were highest on the 8th, 9th, 13th, and 18th, respectively, and much damage was done and some lives lost.

## STATE WEATHER SERVICES.

By Mr. JAMES E. BERRY, Chief of State Weather Service Division.

The following extracts are given in regard to the general weather conditions experienced in the several States and Territories as reported by State Weather Service Directors:

*Alabama.*—The weather conditions of the current April contrasted very favorably with those of the previous month. The temperature was very nearly normal and there was more than the average amount of sunshine. The rainfall was not very evenly distributed, and although it was decidedly below the average (—1.46), yet owing to the excess of the previous month nothing really suffered for want of it.

*Arizona.*—The temperature of the current month was about 4° above the normal with precipitation 0.4 of an inch below.

*Arkansas.*—From the 1st to the 26th the temperature was, with a few exceptions, generally below the normal, but from the 27th to the end of the month, it averaged about 6° per day above. The maximum of 98° reported at Pochontas on the 30th was the highest ever recorded in the State during April. During the greater part of the month the nights were too cool for the rapid growth of vegetation and germination of seeds, but the weather was excellent for all kinds of farm work which progressed well. The precipitation was deficient (—2.69), and the germination of seeds planted late was, therefore, retarded. Showers during the last week of the month did much good and caused cotton, corn, oats, and gardens to grow nicely. The stands of all crops are reported good and the outlook for all crops very favorable. The fruit and berry crop promises an abundant yield.

*California.*—The average temperature for the month was 0.2° above the normal. The highest temperature, 108° was reported from Palm Springs on the 13th; and the lowest, 5°, from Bodie on the 5th. The precipitation averaged 0.96 of an inch below the normal.

*Colorado.*—The mean monthly temperature for the current month was 3.3° higher than the normal, while the precipitation averaged 67 per cent of the normal.

*Connecticut.*—(See *New England*.)

*Delaware.*—(See *Maryland*.)

*Florida.*—The mean temperature for the current month was 3° below the normal, and the precipitation 2.26 inches above. The greatest rainfall, 7.64 inches, was reported from Fort Meade.

*Georgia.*—The month was mild and pleasant with no storms of marked severity. There was a sharp fall in temperature on the morning of the 4th which carried the mercury below the freezing point in the most northerly counties, and resulted in light frosts as far south as the counties of Worth and Irwin. The rainfall averaged about 2.00 inches above the normal.

*Idaho.*—There was a decided fall in temperature on the 5th accompanied by killing frosts, particularly in the southern portion. The mean temperature for the current month was 1.5° higher than that for April of last year, while there was a deficiency in rainfall of 0.97 inch from that for the corresponding period last year.

*Illinois.*—The rapid increase in temperature of April over March is a marked characteristic of the State; this month, April, 1895, the increase in general warmth was nearly one-half of the March temperature. The maximum temperature for the month was 98°, and occurred at Decatur on the 30th; the minimum was 20°, and occurred at Zion on the 2d. Rainfall was largely deficient in the northern and southern sections, the general deficiency for the State being 1.47 inch, the average rainfall for the month being 2.08 inches. The month was generally highly favorable for the preparation of farm land and seedling. Frosts were common in northern and central counties until the 22d. Very little vegetation was far enough advanced to be injured.

*Indiana.*—The average temperature for the State during the month was 2° above the normal and the rainfall, which fell only on a few days in small quantities, was 1.36 inch below the normal. Snow fell only on two days in small quantities. Moderate thunderstorms formed on several days in localities.

*Indian Territory.*—(See *Oklahoma*.)

*Iowa.*—The mean temperature for the State for the current month was 54.2°, about 6° above the normal. The highest temperature reported was 98°, on the 24th, at Glenwood. The average rainfall was about the normal for the month. It was unequally distributed, 5.88 inches, the greatest amount reported, falling at Guthrie Center, while only 0.28 of an inch was reported from Clifton.

*Kansas.*—The average temperature for the current month was 58.6°, being 3.5° in excess of the normal. The average precipitation, 1.29 inch, showing a deficiency of 1.07 inch.

*Kentucky.*—The distribution of temperature for the month was remarkably uniform throughout the State, the mean of the central and western sections being practically the same, and only slightly in excess of that of the mountain districts. The average temperature exceeded the normal by 1.2°. The high temperatures of the last ten days of the month, with abundant sunshine, served to stimulate to a vigorous growth all vegetation which had been retarded by earlier unfavorable weather conditions. Light frosts were reported on the 14th and 15th, but resulted in only slight damage to crops. The average precipitation for the month, 3.18 inches, was less than the normal by 0.62 of an inch.

*Louisiana.*—The mean temperature for April, 1895, averaged over

2° below the normal mean for the month. The deficiency in the northern half of the State was about 2°, while it was nearly 3° in the southern half. Freezing temperature was reported from Liberty Hill on the 3d. There was a deficiency of 1½ inch in the precipitation for the State. The precipitation for the month was very unequally distributed, ranging from only ¼ inch at Shreveport to 8½ inches at Houma. There was about 12 per cent more sunshine than usual during the month throughout the State.

*Maine.*—(See *New England*.)

*Maryland.*—The mean temperature, 52.3°, was 0.6° above the normal. The maximum, 89°, occurred on the 25th at Bel Alton, Hancock, and Popes Creek, Md., and Wilmington, Del.; and the minimum, 18°, at Sunnyside, Md., on the 11th. The average precipitation, 4.97 inches, was 1.13 inch above the normal; the greatest amount, 9.28 inches, being reported from Garrison, and the least, 1.15 inch, from Westernport.

*Massachusetts.*—(See *New England*.)

*Michigan.*—The mean temperature for the State for the month of April, 46°, was 2.1° above the normal. Each section of the State showed an excess of temperature, which was greatest in the upper peninsula and northern counties of the lower peninsula. The highest temperature recorded, 89°, occurred at Flint on the 29th, and the lowest, 17°, at Harrisville, Alcona County, on the 1st, and at Boon, Wexford County, on the 3d. The average total precipitation for the month of April, 1.52 inch, was 0.92 of an inch below the normal. It was slightly above the normal in the upper peninsula; the deficiency occurred south of the straits, and increased toward the southern part of the State.

*Minnesota.*—The month of April, 1895, was characterized by unusual warmth and the absence of any cold spells, together with a great deficiency in rainfall, which retarded the departure of frost in the ground and caused the top soil to become very dry. Exceedingly disagreeable duststorms were frequent, and on the 12th, 14th, and 21st were of marked severity. The soil was placed in excellent condition for rapid germination and growth by the rains of the last six days of the month, when most of the precipitation for the month occurred. At the close of the month vegetation was generally about two weeks in advance of the season's average.

*Mississippi.*—The mean temperature for the month of April was 65.1°, being 0.4° above the normal. The highest temperature, 102°, was reported from Rosedale on the 30th, and the lowest, 30°, from Duck Hill on the 2d. Light frost occurred over the State generally on the 3d and 4th, and heavy frost was reported in the extreme north on the 3d. The total precipitation, 2.87 inches, was 3.56 inches below the normal. The greatest amount, 7.50 inches, being reported from Corinth. Hail was reported on the 6th, 7th, 14th, 16th, 24th, 25th, 26th, and 27th. The storm of the 16th was reported as very severe at Agricultural College and Palo Alto, where some of the hailstones were an inch in diameter and did damage to tender crops.

*Missouri.*—The mean temperature for the State for the month of April was 2.9° above the normal. The highest temperature, 100°, being reported from Darksville on the 30th, and the lowest, 24°, at Sublet on the 2d, and Potosi on the 3d. The average precipitation was 1.94 inch, being 1.82 inch below the normal. Light snow fell at a few stations in the central and northern sections on the 1st and 2d, the heaviest fall reported being 2.5 inches at Kidder. The conditions throughout the month were very favorable for planting and the rapid advancement of farm work, but in many of the northwestern, central, and southeastern counties grasses and small grain were seriously injured by drought.

*Montana.*—The temperature for April, 1895, was about 3° above the normal, the average for the State being 47°. The highest daily temperature, 86°, occurred at Mussellshell on the 24th, and the lowest, 7°, at Deer Lodge on the 6th, and at Fort Keogh on the 14th. The precipitation was about 0.30 of an inch below the normal. The average for the State being 0.80 of an inch.

*Nebraska.*—April, 1895, was an extremely warm month, enabling farmers to bring their spring work well forward. The extremes of temperature were not great, 96° being the highest, and 15° the lowest, while the record for previous years shows a maximum temperature of 100° and a minimum of 1°. The precipitation was but slightly below the normal.

*Nevada.*—The mean temperature for the State was 48.2°, 0.2° below the normal. There was an abnormal amount of sunshine in the northern and northwestern portions. The precipitation, 0.42 of an inch, was much less than usual for April, being a deficiency of 0.33 of an inch. April was very well suited to the preparation of the ground for seeding.

*New England.*—The average temperature for April, 1895, 45.9°, is 0.9° in excess of the normal. The precipitation, 4.60 inches, shows a departure from the normal of +1.39 inch. At most places nearly all of the precipitation occurred during the first half of the month. The heavy local rains of the 8th to 10th and 13th to 15th caused the rivers and streams to overflow, which did inestimable damage through all north-central New England.

*New Hampshire.*—(See *New England*.)

*New Jersey.*—The mean temperature for the State, 49.1°, is 1.2° above the normal, and the precipitation, 4.88 inches, is 1.41 inch above the

normal. The largest amount of precipitation, 7.75 inches, was reported from Junction, and the least, 3.47 inches, from Deckertown. Thunderstorms were reported on the 1st, 2d, 9th, and 22d. Hail occurred on the 9th. There was a heavy freshet in the Delaware River on the 10th, the water being higher than since 1878. Some old residents along the river assert that it was the greatest flood since 1841.

*New Mexico.*—The temperature during April averaged about normal. The highest reported was 93°, at Eddy, on the 29th, Rincon, on the 14th, and at Roswell, on the 28th. The lowest, 7°, occurred at Monero, on the 5th. The precipitation was very light and much below the normal for April.

*New York.*—The average of the mean temperature was 0.6° above the normal, and the precipitation for the month shows a departure of -0.13 of an inch. Hail fell on the 1st, 9th, 13th, and 23d, and sleet on the 1st. Thunderstorms occurred on the 1st, 9th, 20th, 22d, 25th, 26th, and 27th.

*North Carolina.*—The mean temperature for the month of April, 1895, was 56.9°, 0.8° below the normal, while the precipitation was very much above. The average amount for the month was 7.35 inches, being a departure of +3.51 inches. The greatest amount, 14.84 inches, was reported from Highlands, and the least, 3.09 inches, from Waynesville. Some extremely heavy rains were reported on the 7th and 8th, which caused almost unprecedented freshets in the streams, which did considerable damage in the lowlands. Killing frost was reported as late as the 19th in the western portion of the State, and on the 4th at some stations in the eastern portion.

*North Dakota.*—The mean temperature for the month of April, 1895, was 49.6°, a departure of +9.6°, and the precipitation was 2.23 inches, a departure from the normal of +0.55 of an inch. What promised to be a backward spring and a failure of crops resulted, owing to timely rains, in a fine growth full three weeks ahead of the average spring in this region.

*Ohio.*—The mean temperature for April was 1.6° above the normal, and the precipitation was 0.85 of an inch below. The snowfall was light and afforded insufficient protection to grain. Owing to the cool nights generally throughout the month and the lack of moisture the crops were retarded in growth.

*Oklahoma.*—The mean temperature for April was 2.6° above normal, and the precipitation, 1.24 of an inch, was 1.65 of an inch below. The month was characterized by high winds and sandstorms, the most severe of the latter occurred on the 5th. The month closed with the long drought practically unbroken.

*Oregon.*—April, 1895, was an ideal month for the farmers. The weather was much warmer than usual, while the precipitation was about normal. The temperature departure was +2.4°, and that for the precipitation only -0.09. This month's weather conditions were, on the whole, quite favorable to farmers and fruit growers. Light frosts were frequent. A few killing frosts occurred on the 4th, 5th, 14th, and 29th, which did little or no damage.

*Pennsylvania.*—The average temperature for April, 1895, 49.2°, is 1.2° above the normal, and the average total precipitation, 3.76, shows an excess of 0.48 of an inch. Thunderstorms occurred on the 1st, 9th, 13th, 14th, 25th, 26th, and 27th; hail on the 1st, 2d, and 13th; and snow on the 2d, 3d, and 15th. At the close of the month grain and grass were in good condition, but had made slow growth, and all vegetation continued unusually late and backward.

*Rhode Island.*—(See *New England*.)

*South Carolina.*—April, 1895, was cooler than usual, the most marked departures being recorded during the second decade. The rainfall was 177 per cent of the normal. The last killing frost occurred on the 4th in the extreme western counties, and the last light frost on the 19th generally throughout the State. The mean temperature, 61.4°, was 1.4° below the normal, and the precipitation, 5.55 inches, was 2.41 inches above. It was an extremely favorable month for germination and for vegetable growth generally, but the excessive rainfall hindered and delayed farming operations.

*South Dakota.*—The temperature for the month, 53.4°, was about 8.5° above the normal, while the precipitation was nearly normal, being only 0.09 of an inch above the average. Severe dust and sand storms occurred on the 4th, 5th, 14th, 25th, and 27th over portions of the State, the most severe and the most general occurring on the 14th. Lightning at Nashville, in Harding Co., on the 27th, killed 52 sheep. Thunderstorms occurred on the 5th, 6th, 10th, 15th, 26th, 27th, 28th, 29th, and 30th. Hail occurred on the 26th, 28th, and 30th, and sleet on the 1st, 4th, 5th, and 6th.

*Tennessee.*—The average temperature for the month was 58.4°, being but 0.2° below the normal, and the precipitation, 3.67 inches, showing a deficiency of 0.51 of an inch. The greatest monthly precipitation, 7.42 inches, occurred at Carthage, and least, 0.91 of an inch, at Trenton. Killing frosts were reported for the 3d, 4th, 5th, 11th, and 15th.

*Texas.*—The temperature on an average for the State was 0.4° below the normal. It ranged from about normal to 4.2° below over east Texas and the eastern portions of north and southwest Texas, while over other portions of the State there was an excess ranging from 0.2° to 2.2°. The precipitation was 1.58 inch below the normal for the State. There was almost an entire absence of rain during the first and second decades, while some excessive falls were reported in the last

decade. Snow occurred on the 5th at Happy and Hartley. On the 24th a severe tornado struck Lytle, doing considerable damage. Hailstones became chunks of ice and fell with a force that broke through roofs of houses, imbedded themselves in trees, killed animals, and knocked men senseless to the ground. The tornado spent its force in about fifteen minutes.

*Utah.*—The mean temperature for the Territory was 49.2°. The highest daily, 94°, was reported from St. George on the 20th, and the lowest, 5°, from Loa, on the 5th. The average total precipitation was 0.58 of an inch, which fell principally on the last two days of the month. The greatest amount, 5.20 inches, was recorded at Levan, and the least, trace, at Cisco, Giles, and Emery. Thunderstorms were reported on the 10th, 27th, 28th, and 29th, and hail on the 14th, 28th, and 29th.

*Vermont.*—(See *New England*.)

*Virginia.*—The average monthly mean temperature for April, 1895, was 54.4°. The maximum daily was 95°, and occurred at Bon Air on the 25th, and the minimum was 22° at Grahams Forge on the 4th. The total amount of precipitation, 4.91 inches, averaged above the normal for the State. The greatest amount, 9.61 inches, occurred at Callaville, and the least, 1.16 inches, at Abingdon. Killing frosts were reported on the 3d, 4th, 5th, 9th, 10th, 11th, 12th, 15th, 16th, 17th, 18th, and 19th, but generally little or no damage resulted from them because of backward state of vegetation.

*Washington.*—April, 1895, was a trifle warmer than usual, the mean

temperature for the State being 1.2° above the average. The precipitation was slightly below the average and was unevenly distributed, the eastern portion receiving fully one-half less than the average, while there was an abundance in the western portion. The total precipitation, 3.36 inches, shows a departure from the average of -0.41 of an inch. A phenomenal thunderstorm visited many localities in the western part of the State on the 9th, accompanied by hail and violent wind. Considerable timber was blown down. The eastern section was visited on the 1st by a violent duststorm, the severest ever known there, which unroofed some buildings, broke windows, carried away fences, etc.

*West Virginia.*—The mean temperature for the month, 52.6°, was about 14° below the normal, and the precipitation, 2.93 inches, was well distributed and very near the normal. Many frosts occurred and snow fell to a depth of 2 to 3 inches at several points.

*Wisconsin.*—The average temperature for the month, 47.5°, was 3.4° above the normal for April, and the precipitation, 1.29 inch, was 2.11 inches below the normal. Most of the precipitation occurred between the 6th and 13th, except in the extreme northern portion, where considerable fell near the close of the month, but in other portions very little fell during the last fifteen days.

*Wyoming.*—The mean temperature for the month was 46°, which was several degrees above the average for April. The precipitation, 2.36 inches, was about one-third greater than the average. The greatest amount, 7.25 inches, being reported from Fort Washakie, and the least, 0.61 of an inch, from Fort Yellowstone.

## NOTES BY THE EDITOR.

### OBSERVATIONS AT HONOLULU, HAWAIIAN ISLANDS.

*Meteorological observations at Honolulu, Republic of Hawaii, by Curtis J. Lyons, Meteorologist to the Government Survey.*

Pressure is corrected for temperature and reduced to sea level, but the gravity correction, -0.08, is still to be applied.

The absolute humidity is expressed in grains of water, per cubic foot, and is the average of four observations daily.

The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 10.

The rainfall for twenty-four hours is given as measured at 6 a. m. on the respective dates.

April, 1895.	Pressure at sea level.			Temperature.						Humidity.			Wind.		Cloudiness.	Rain measured at 6 a. m.
	9 a. m.	3 p. m.	9 p. m.	6 a. m.	2 p. m.	9 p. m.	Maximum.	Minimum.	Relative.		Absolute.	Direction.	Force.			
									9 a. m.	9 p. m.						
1	Ins.	30.11	Ins.	69	76	71	78	69	65	69	5.8	nne.	4	4-2	Ins.	
2	30.19	30.08	30.14	70	75	71	78	69	65	68	5.7	ene.	5	4	.00	
3	30.12	30.05	30.11	69	75	70	76	68	63	75	5.8	ne.	5	4	.01	
4	30.10	30.02	30.10	68	77	71	80	65	70	72	6.2	se.ne.	0-3	6-1	.01	
5	30.12	30.06	30.14	70	77	71	79	69	69	68	5.8	nne.	4	2	.00	
6	30.16	30.07	30.14	70	76	71	78	69	64	72	6.1	ne.	5	3	.03	
7	30.17	30.06	30.17	70	74	70	75	69	69	75	6.1	ne.	5	3	.03	
8	30.17	30.08	30.20	69	75	70	75	67	68	70	5.8	ene.	5	5	.02	
9	30.30	30.13	30.18	69	76	71	78	68	66	75	6.0	ene.	5	3	.02	
10	30.30	30.09	30.16	70	75	70	78	70	69	76	6.2	ne.	4	3	.02	
11	30.18	30.12	30.20	68	76	70	78	67	65	72	5.9	ne.	4	2	.08	
12	30.26	30.19	30.26	68	74	68	76	66	60	71	5.0	nne.	3	4-1	.00	
13	30.30	30.22	30.28	68	74	68	76	66	61	68	5.0	nne.	4	6	.04	
14	30.26	30.15	30.20	69	74	68	75	68	61	73	5.4	ne.	4	4	.14	
15	30.16	30.09	30.17	68	74	70	76	67	65	70	5.6	nne.	5	5	.00	
16	30.21	30.14	30.20	66	74	69	75	66	75	85	6.3	nne.	4	8	.37	
17	30.21	30.14	30.21	70	77	72	79	68	65	78	7.1	nne.	4	7	.56	
18	30.30	30.13	30.18	71	77	72	78	71	77	77	6.8	ne.	4	8	.13	
19	30.17	30.10	30.17	70	77	72	79	70	70	75	6.6	ene.	3	5	.21	
20	30.17	30.06	30.14	65	78	71	80	65	65	72	6.2	nne.	3	2	.00	
21	30.15	30.06	30.14	63	77	70	80	61	64	72	5.9	ne.	3	2	.00	
22	30.11	30.04	30.13	61	77	70	80	60	60	68	5.7	nne.	3	2	.00	
23	30.11	30.01	30.09	61	77	71	80	61	66	69	5.6	nne.	3	2	.00	
24	30.09	30.02	30.12	62	79	71	82	61	66	72	6.1	se.ne.	3	2	.00	
25	30.11	30.05	30.14	67	81	74	82	65	64	66	6.3	e.	3	2-5	.00	
26	30.13	30.05	30.13	70	79	70	82	69	61	77	6.0	nne.	3	1	.00	
27	30.13	30.05	30.11	68	81	72	82	65	62	65	6.2	nne.	3	1	.00	
28	30.12	30.07	30.13	68	78	73	81	67	70	70	6.6	sw.	2	10	.06	
29	30.16	30.08	30.17	73	81	73	83	67	70	72	6.7	ne.	1	5	.00	
30	30.21	30.12	30.23	73	81	74	83	71	63	70	6.4	ne.	4	3	.02	
	30.169	30.088	30.183	68.0	76.5	70.9	78.5	66.8	67.6	72.1	6.1	.....	.....	.....	1.77	

Mean temperature: 6 + 2 + 9 + 3 is 71.8; extreme temperatures, 88° and 60°.

On the island of Maui, 31.13 inches of rain fell in twenty-four hours on the 16th of the month; of this amount, 14.00 inches fell in four hours—from 12.30 to 4.30 p. m.

At Oiaa, Hawaii, 13.65 inches fell in twenty-four hours. This precipitation was synchronous with heavy storms in Oklahoma and New England.

### THE PASSAGE OF LOW AREAS OVER THE ROCKY MOUNTAINS.

On the 12th an area of high pressure was central in Kansas and the barometer had begun to fall in Arizona and British Columbia. On the 13th, p. m., pressure was lowest

in Saskatchewan and a trough extended from this region to the Gulf of California; temperatures from 65° to 70° prevailed from New Mexico to Manitoba, with southeasterly winds, and temperatures from 50° to 60° prevailed over the plateau region and Pacific coast with easterly winds, except in Arizona, where 92° and 96° were reported. During the 14th the trough of low pressure extended rapidly southward, and at 8 p. m. the isobar of 29.4 extended from Manitoba to Colorado. To the east and west of this trough pressures were higher, being highest, 30.1, over Lake Superior and San Francisco, respectively. On the east side southwest winds prevailed with rather high temperature, and on the west side, over the plateau regions, westerly winds with low temperatures. By the 15th, a. m., the northern portion of the area of low pressure had mostly filled up, but a small area of still lower pressure, 29.2, remained in central Kansas; this moved slowly eastward reaching eastern Kansas by 8 a. m. of the 15th and central Arkansas by 8 a. m. of the 16th.

The international maps of the Northern Hemisphere, which were published by the Weather Bureau for many years, demonstrate clearly that, in general, areas of high pressure and low pressure that first appear in the northwestern corner of the current daily weather map do not, properly speaking, originate either in Alberta or British Columbia, but are portions of a larger system of areas of high and low pressure that circulate between latitudes 40° and 70°. These highs and lows are so connected together that sometimes they may be treated as interacting cyclones and anticyclones, while at other times they are the interacting troughs and crests of waves, and again they are considered as minor episodes, like the whirlpools in a rapid stream of water. In this last case the cyclone is spoken of as a "driven eddy," although according to hydraulics, these eddies move as a whole, with only half the velocity of the average motion of the water within them. The international maps show, moreover, that when an area of low pressure or a cyclonic system of winds approaches the coast of British Columbia and Alaska it is generally moving from southwest toward the northeast, and that soon afterward an area of low pressure has developed south and east of the original center, namely in Alberta and Saskatchewan on the eastern slope of the Rocky Mountains. Several days are required for this process by which a storm dies away on the western slope while a new one develops on the eastern slope.

Generally speaking the well-defined whirl that characterized